

PSYCHOLOGY INFORMATION FOR STUDENTS

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1. SOCIAL FACILITATION AND INHIBITION IN HUMANS AND ANIMALS - TWO CLASSIC STUDIES
2. THE EVALUATION OF THE FUNDAMENTAL ATTRIBUTION ERROR
3. PSYCHOBIZARRENESS THEORY (PBT) OF NEUROSES

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SOCIAL FACILITATION AND INHIBITION IN HUMANS AND ANIMALS - TWO CLASSIC STUDIES

INTRODUCTION

Research over the years has shown that the presence of others influences performance. In some cases, it improves performance (social facilitation)¹, and in others, it causes a deterioration (social inhibition).

Early human studies concentrated on simple tasks alone and in the presence of others doing the same task (co-actors).

While work with animals showed facilitation of eating and drinking (ie: more consumed), and bar pressing, for example, in groups (Zajonc et al 1969).

Yet there were situations where both animal or human performance deteriorated in the groups. Zajonc et al (1969) were most aware of Gates and Allee's (1933) finding of a decline in performance of cockroaches learning an E-shaped maze in groups compared to alone. Gates and Allee had explained the finding through distraction from chemicals released by the cockroaches that interfered with orientation.

Any theory of social facilitation has to explain the improvement and deterioration in performance with others present. Zajonc (1965) proposed a theory (based on the Spence-Hull drive theory; Spence 1956) where the presence of others is an arousal that encourages the dominant response:

If the animal's dominant responses are appropriate from the point of view of the experimental situation, the presence of others will enhance them; and the resulting performance will appear as being improved. If those dominant responses are largely inappropriate, however, performance in the presence of others will appear as being impaired (Zajonc et al 1969 pp83-84).

TRIPLETT (1898)² - EARLY STUDY WITH HUMANS

This classic piece of research³ performed at the Psychological Laboratory of Indiana University⁴, USA used a combination of methods to compare individual performance and in the presence of others.

¹ The term "social facilitation" was coined by Allport (1920).

² Sometimes referred to as Triplett (1897).

³ The "first controlled investigation of the psychological effects of the presence of others" (Brown 1996). Some writers have described it as "marking the birth of social psychology" (Strube 2005).

⁴ As Triplett's master thesis (Davis et al 1995).

1. Real data from cyclists

The official records of the Racing Board of the League of American Wheelmen up to the end of 1897 including over 200 cyclists "all ambitious to make records" were obtained. The times were divided into those alone against the clock (unpaced time trials), alone with a pacemaker on a "swift multicycle, such as a tandem or 'quod'" (paced time trials), and competitive races (paced competition). All the timings were standardised to a distance of twenty-five miles.

The study of the times had originated in the cyclists' observations that they could save 20-30 seconds per mile when paced compared to unpaced. This is a good example of how research can develop from everyday observations of behaviour.

The cyclists produced faster times with the presence of others (table 1). Paced riders could ride 25 miles in the time it took unpaced riders to reach twenty miles.

Unpaced	2 min 29.9 secs
Paced	1 min 55.5 secs
Paced competition	1 min 50.35 secs

(After Triplett 1898)

Table 1 - Average time per mile over 25 miles.

The racing times, however, were not comparable because different riders took part in unpaced and paced races with different abilities. In other words, riders better at races competed in them and riders better at unpaced time trials preferred those.

Triplett explained the increased performance in the presence of others with the "dynamogenic theory". The "bodily presence of another rider is a stimulus to the racer in arousing the competitive instinct; that another can thus be the means of releasing or freeing nervous energy for him that he cannot of himself release; and, further, that the sight of movement in that other by perhaps suggesting a higher rate of speed, is also an inspiration to greater effort" (p516).

2. Laboratory experiment with reel-turning apparatus

Triplett designed apparatus that involved two fishing reels (original drawing in appendix 1), and the time to reel four circuits of four metres (ie: 16

metres) (estimated to take about 150 turns) could be recorded. Over 200 individuals were tested with the apparatus, but the data from forty children (aged 8-17 years) were used (details in appendix 2).

After practice, each child performed the task alone or in competition alternated over six trials each⁵. There were five minute intervals between each task to alleviate fatigue.

There were eighty cases where there was an improvement in times when competition followed an alone condition, and 45 cases of the opposite. Based on the times recorded, Triplett divided the children into three groups - those whose time improved in competition compared to alone (20 children) ("subjects stimulated positively"), those who took longer in competition (10 children) ("subjects stimulated adversely")⁶, and ten children, "subjects little affected by competition" (own charts in appendix 3).

The first group made average improvements of four seconds in competition⁷. For example, "Violet F" (aged 10) showed the largest improvement from 54.4 seconds alone on the first trial to 42.6 seconds in competition in the next trial. The results were not statistically analysed which is common practice today.

Table 2 summarises the average times for each group as I calculated from Triplett's data (see individual calculation in appendix 4).

GROUP	ALONE	COMPETITION
"stimulated positively"	43.57	39.53*
"stimulated adversely"	37.78	38.59
"little affected by competition"	33.07	31.78

(* = significant improvement for this group; my analysis)

(Data from Triplett 1898)

Table 2 - Average times of Triplett's three groups of children.

For the first alone condition, boys were

⁵ Half the children followed the order of alone (A) and competition (C) alternated as ACACAC, while the other half followed AACACA. There were two reeling points on the apparatus, and this accounts for the two groups. Both reels were right-handed, yet two of the children were left-handed.

⁶ Fourteen of the 25 races equal or lower than the preceding alone condition. "An intense desire to win, for instance, often resulting in over-stimulation. Accompanying phenomena were laboured breathing, flushed faces and a stiffening or contraction of the muscles of the arm" (p523).

⁷ My analysis of average times with Wilcoxon signed ranks test ($T = 1.5$, $N= 20$) found the improvement significant ($p<0.001$; one-tailed).

significantly faster than girls (mean 37.89 vs 45.47 seconds) (Strube 2005).

Strube (2005) analysed the data with statistical tests used today, and found that, overall, there was no clear evidence for social facilitation⁸. A significant difference can be "coaxed from the data" with a particular analysis of individuals' performance alone and paired, but it is no more than a 1.81% reduction in time when performing with others (Strube 2005)⁹.

3. Laboratory experiment on counting

Ten participants were asked to count aloud from 1 to 20 as rapidly as possible in five seconds for three trials. Half the participants were then encouraged to go faster by the experimenter "pacing" them (ie: speaking faster) for three trials. The other half performed three more trials alone. This occurred on six successive days, and the participants varied their condition each day.

All participants showed improvements with "pacing" much more than the individuals alone - 6.2% vs 0.5% improvement (my analysis: significant at $p<0.01$ with chi squared).

Evaluation

1. The design of the experiment was repeated measures which has the risk of order effects. This is when performance on one condition influences performance on another condition. In this case, boredom, fatigue or practice in turning the fishing reels.

Thirty-five children were faster on the last alone condition compared to the first alone condition suggesting the practice effect.

2. The use of a combination of methods with real-life and experimental data was good.

3. The tasks in the laboratory experiments were very artificial which can limit their applicability to real-life.

4. Triplett divided the children into three groups based on the results. But looking at average times for each participant (see appendix 4) shows that 29 individuals showed improvements in competition and 11 children were

⁸ Strube's analysis found no significant differences in a between-groups comparison of alone vs competition using the t-test.

⁹ Removal of the data of the two left-handed participants means that any significant differences no longer exist in the data (Strube 2005).

faster alone. I applied χ^2 to these numbers and it shows that significantly more children improved in competition ($\chi^2 = 8.10$; $df = 1$; $p < 0.005$; one-tailed).

If the focus is upon the alone conditions followed by competition, there were 100 such cases. Of these, 67 cases showed a faster time in competitive condition, 28 an increase in time and five no difference (my analysis: significantly different; $\chi^2 = 16.00$ for faster vs slower in competition condition; $p < 0.001$).

The data could be analysed as between-groups (independent design) (different children performing alone) or within-groups (repeated measures) (the same individuals performing alone and in pairs) (Strube 2005).

Strube (2005) argued that, using statistical analysis of Triplett's data, there was little improvement in co-action compared to alone for individuals (mean 37.14 vs 37.70 seconds).

5. Triplett tested the co-action effect and competition, but not knowingly the effect of an audience on performance. However, based on the knowledge of the "mere presence effect", the alone condition would have been influenced by the presence of Triplett with a stopwatch.

6. Details are not given about the children, so it is not possible to know if they were a representative sample. A representative sample means that findings can be generalised more confidently to the whole population.

7. "Even by today's standards, Triplett's method showed admirable attention to detail" (Strube 2005 p272). However, the research report had omissions compared to experiments today (table 3) including no details on how participants were assigned to each condition, nor the instruction or the exact procedure. For example, paired participants were sometimes given verbal encouragement, and some participants in the alone condition had observers (Strube 2005).

- Experimental and null hypotheses
- Sampling details
- Details of allocation of participants to each condition
- Standardised instructions given
- Standardised procedures used and explained
- Statistical analysis of results

Table 3 - Key elements used and reported in modern experiments.

8. Why did Triplett not give details of the "nearly 225 persons of all ages" (p520) he tested, and only concentrated on the forty children's results?

9. Strube (2005) noted errors in reporting Triplett's work in textbooks, which included describing the cyclists' data as from an experiment (Bernstein et al 2000), and emphasising the fishing reels aspect of the apparatus (table 4). "The reels were used to make a silk thread traverse a closed circuit, in the fashion of a pulley, with no line actually being wound onto the reels" (Strube 2005 p284).

AUTHORS	MISTAKE
Feldman (1995)	significant differences found
Aronson et al (2002)	"wind up fishing line on a reel" (p306)
Brehm et al (1999)	"wind up fishing reels" (p249)
Myers (2001)	"wind string of a fishing reel" (p293)
Nairne (2003)	"wind in a fishing line" (p461)

Table 4 - Examples noted by Strube (2005) of mistakes in textbook in reporting Triplett's study ¹⁰.

10. The experiment was not, as Triplett intended, alone versus competition because:

The competition element entered into the trials alone and it was found advisable in some cases to keep from the subject the time made, as there was a constant drive to beat his own or his friend's records and thus make all the trials competitive.. It is felt, therefore, that succeeding trials alone are not really non-competitive trials" (Triplett 1898 p530).

11. Strube (2005) pointed out that if modern standards of statistical analysis had been applied to Triplett, his work would not have been published. However, the publication of the studies was positive:

It seems likely that social facilitation would have been demonstrated eventually, but one wonders how long that demonstration would have been delayed or how many creative minds would have been put off the trail had the significance criterion had such sway then that it has now. It seems likely that a different birthday and originator for experimental social psychology would be celebrated today (p281).

¹⁰ A cursor glance in two well-known classic British psychology textbooks found similar reports:

- Gross (1992) "winds of a fishing reel" and "performance was clearly superior in the pairs condition" (p554);
- Hayes (1994) "turning a fishing reel".

Overall, Triplett's "creative and prescient speculation about the conceptual underpinnings of social facilitation laid the groundwork for the important and statistically significant research that followed" (Strube 2005 p281).

ZAJONC ET AL (1969) - CLASSIC STUDY WITH COCKROACHES

Whereas Triplett was interested in performance in competition, it became clear in time that performance could also deteriorate in the presence of others. So when Zajonc et al were working, this difference was known.

Zajonc et al (1969) described a pair of experiments aiming to confirm Zajonc's (1965) arousal theory, and partly replicating Gates and Allee (1933).

Experiment I

Seventy-two adult female cockroaches (*Blatta orientalis*) were used. One week prior to the experiment, the cockroaches were placed in individual mason jars with screened lids and kept in darkness. They were fed regularly on peeled and sliced apples.

There was a simple runway and a maze. The former was a twenty-inch long straight plexiglass tube from the starting point (with a floodlight ten inches behind) to the goal box (darkness)(full description in appendix 5). Cockroaches do not like bright light and this is the motivation for them to run.

The maze was a cross design, which meant that the cockroach had three choices (straight, right or left) after nine inches from the start with the goal box at the end of a right turn. The total length was still twenty inches. The cockroaches performed alone or in pairs, and the length of time to reach the goal box was measured ("running time") ¹¹.

The trial was terminated after five minutes if the animal had not reached the goal box. The speed of starting ("starting latency") was also recorded.

The other variable was the presence of a passive audience of ten adult female cockroaches or not. The audience was in boxes next to the runway and maze with air-holes that allowed the transmission of olfactory cues.

The independent variables were alone/paired (co-

¹¹ This part of the experiment was a partial replication of Zajonc (1968).

action), runway/maze (complexity of task), and audience/no audience (social condition). It was an independent groups design experiment, where individual animals performed one of the eight conditions only (table 5).

CONDITION	RUNWAY	MAZE
NO AUDIENCE: ALONE	control (8)	complexity of task
NO AUDIENCE: PAIRED	co-action (8)	co-action/complexity
AUDIENCE: ALONE	social (10)	social/complexity of
AUDIENCE: PAIRED	social/co-action (10)	social/co-action/complexity of

Table 5 - Numbers of cockroaches (in brackets) and independent variables in each condition.

The apparatus was designed to be dark except for the 150-watt floodlight to avoid visual imitation of behaviour. Before each trial the apparatus was swabbed with alcohol (which evaporated swiftly) to remove olfactory cues of previous participants.

Median running times were calculated for each condition because the distribution of scores was skewed which could be a problem for the mean. The results can be summarised as follows (table 6):

- Independent variable - alone/paired: Cockroaches ran faster when paired, and this was an even greater difference with an audience. So the presence of others improves performance on a simple task;
- Independent variable - runway/maze: Cockroaches took longer to run the maze than the runway in all cases, and this was longer with the presence of others. Co-actors and audiences lead to deterioration in performance on complex tasks;
- Independent variable - audience/not: As mentioned above the presence of an audience affects behaviour depending on the nature of the task.

Zajonc et al admitted: "Unfortunately, because these subjects came from different colonies, we are unable to determine from the data alone whether these differences are due to the diverse origins of the two groups of animals, or whether they have something to do with the experimental treatments" (p88).

CONDITION	RUNWAY	MAZE
No audience: alone	40.58	110.45
No audience: paired	32.96	129.46
Audience: alone	62.65	221.35
Audience: paired	39.30	296.64

(After Zajonc et al 1969)

Table 6 - Median running times (in seconds) for each condition ¹².

Experiment II

This experiment was designed to find out more about the effect of the presence of others. One hundred and eighty more adult female cockroaches were divided evenly into six conditions using similar apparatus to experiment I:

i) Control groups - runway or maze alone;

ii) Mirror groups - runway or maze alone, but now a mirror was fitted along the wall. This produced the presence of a co-actor to test for visual effects (without olfactory cues).

In the co-action situation in experiment I, it is possible that one animal was imitating the other in running to the goal box. Tolman (1965) found that young chicks ate more in the presence of a mirror, but not as much as with a co-actor;

iii) Olfactory groups - runway or maze alone, but odour of cockroaches impregnated the apparatus. This tested the effects of the audience from experiment I (without visual cues of a cockroach).

Table 7 lists the median running times for each condition.

In this experiment, the cues of the presence of others did not improve times on the runway. The mirror condition improved performance on the maze (complex task) from when alone. This partly contradicts the findings from experiment I. "One conclusion to be drawn from the results is that in order for drive effects to take place the presence of conspecifics must be actual" (Zajonc et al 1969 p91).

¹² Using ANOVA, co-action vs audience = significant at $p<0.001$; alone vs paired and runway vs maze = not significant (Zajonc et al 1969 table II p88).

CONDITION	RUNWAY	MAZE
Alone	55.67	219.63
Mirror	77.21	160.71
Odour	69.53	245.72

(After Zajonc et al 1969)

Table 7 - Median running times (in seconds) in experiment II.

Evaluation

1. The use of cockroaches increased the control of variables, animals, and the environment for the researchers. The experimental method allows such controls anyway with standardised procedures.
2. The runway and maze, though the same distance, were not identical tasks because the latter required a right turn. The researchers did not vary this turn to see the effects of a left turn.
3. How applicable are the findings from cockroaches to human behaviour?
4. Difficulties in interpreting results because the animals cannot be asked about their experiences, as human participants can be, and the concern about assuming "higher motivations" for these animals.
Zajonc et al admitted: "Had the present been experiments using human subjects one could easily raise questions about self-disclosure, evaluation apprehension, the approval motive, etc. But one finds it rather awkward to attribute this sort of motivation to the cockroach.." (p91).
5. The experiments tested both co-action and audience effects to see if the presence of others in different ways had an effect on behaviour.
6. Zajonc et al considered the need for another condition with the simple presence of another cockroach immobile (eg: dead), but it was decided that this could produce an alarm response and interfere with the experiment.
7. The cockroaches were not harmed during the experiment, and were kept in acceptable conditions otherwise.
8. An independent groups design avoids problems of

participants doing more than one condition, but there is no guarantee that the groups are comparable in terms of participant variables.

9. Subsequent research with humans have supported the findings. For example, Michaels et al (1982) found that above-average student pool players (well-learned/simple task) improved their shot accuracy with an audience present while below-average players (unlearned/complex task) showed a decline.

10. Zajonc's theory to explain social facilitation and inhibition based on arousal has subsequently been challenged by other theories like evaluation apprehension, and social comparison.

CONCLUSIONS

Though both studies are a few years old, they are still important because they are part of the scientific collection of knowledge. Only after a piece of research is done, even if it is proved wrong at a later date, does it stimulate further research, and knowledge is acquired.

Both studies were performed because of previous work - Triplett after E.B. Turner in 1889 on the physiology of pacing cycle races, and Zajonc et al after Gates and Allee (1933).

Triplett's general principle of improvement in performance in competition still stands, even if it has been refined, and despite reservations about finding any significant differences (Strube 2005). Zajonc et al highlighted the situation that performance improves in front of others for simple tasks and declines for complex ones.

Subsequent research has shown that as well as co-actors/competitors and an audience, performance can be influenced by the "mere presence" of others. For example, Schmitt et al (1986) included an audience wearing blindfold and headphones in their experiment. In this condition, participants' performance on a simple task improved and on a complex task deteriorated.

Earlier research by Bergum and Lehr (1963) found that the presence of others does not have to be physically there. US National Guard trainees were asked to watch a revolving panel of lights for failures (average of 24 failures per hour). The participants were asked to perform this task for 135 minutes but warned that a superior would visit them. The participants worked in individual booths, and were briefly visited on four occasions. In this condition ("presence of superior"), there was 34% higher accuracy for detecting light failures than in the alone condition where no superior

was expected to visit (Zajonc 1965)

Triplett and Zajonc et al are not really comparable studies because one involves human participants and the other cockroaches. There are advantages and disadvantages of studying each group (table 8).

ADVANTAGES	DISADVANTAGES
<p>Humans</p> <p>1. Able to tell experimenter what feeling and thinking.</p> <p>2. Studying humans to understand humans makes sense.</p> <p>Animals</p> <p>1. Able to control and manipulate in way not possible with humans.</p> <p>2. Able to study in way that classed as unacceptable for humans.</p>	<p>Humans</p> <p>1. Problems with "demand characteristics" and similar such behaviours in experiments.</p> <p>2. Can be difficult to recruit volunteers and participants.</p> <p>Animals</p> <p>1. Applicability of findings with animals to human behaviour.</p> <p>2. Have to make assumptions about what animal is feeling, and why</p>

Table 8 - Key advantages and disadvantages of using human or animal participants in experiments.

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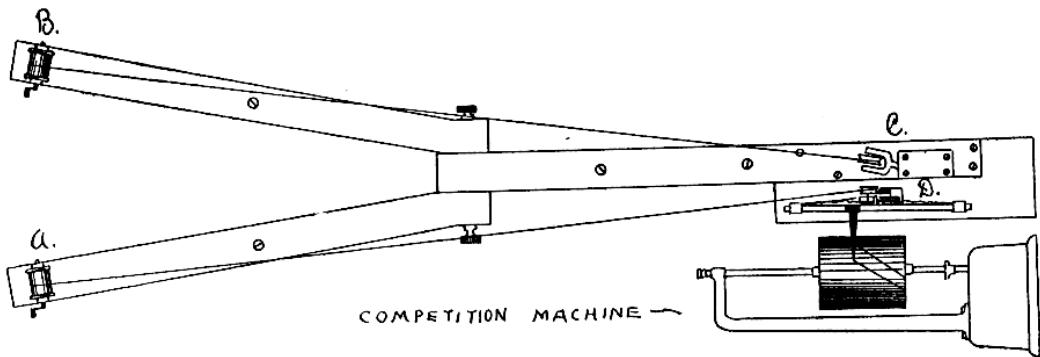
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APPENDIX 1



(Source: Triplett 1898 p519; <http://psychclassics.yorku.ca/Triplett/>)

Figure 1 - Machine designed by Triplett for co-action experiments.

APPENDIX 2

Number of children studied = 40

Female = 23

Male = 17 ¹³

Age range: 8 - 17 years

	TOTAL	FEMALE	MALE
Mean	11.6	11.5	11.8
Median	11.0	11.0	12.0
Mode	11.0	11.0	12.0

(Data from Triplett 1898 Tables I-III pp521-2)

Table 9 - Average ages of children (in years)

AGE (yrs)	TOTAL NUMBER OF	FEMALES	MALES
8	1	1	0
9	4	2	2
10	4	4	0
11	12	8	4
12	8	2	6
13	7	3	4
14	2	1	1
15	1	1	0
17	1	1	0
TOTALS	40	23	17

(Data from Triplett 1898 Tables I-III pp521-2)

Table 10 - Breakdown of ages and gender of Triplett's sample.

¹³ Strube (2005) noted 14 boys and 26 girls. This difference is due to the ambiguity of first names, which is all that Triplett used, like "Milfred". Strube, for example, decided that "Willie" was a girl and this was a pet name; I took it to be a boy's name.

APPENDIX 3

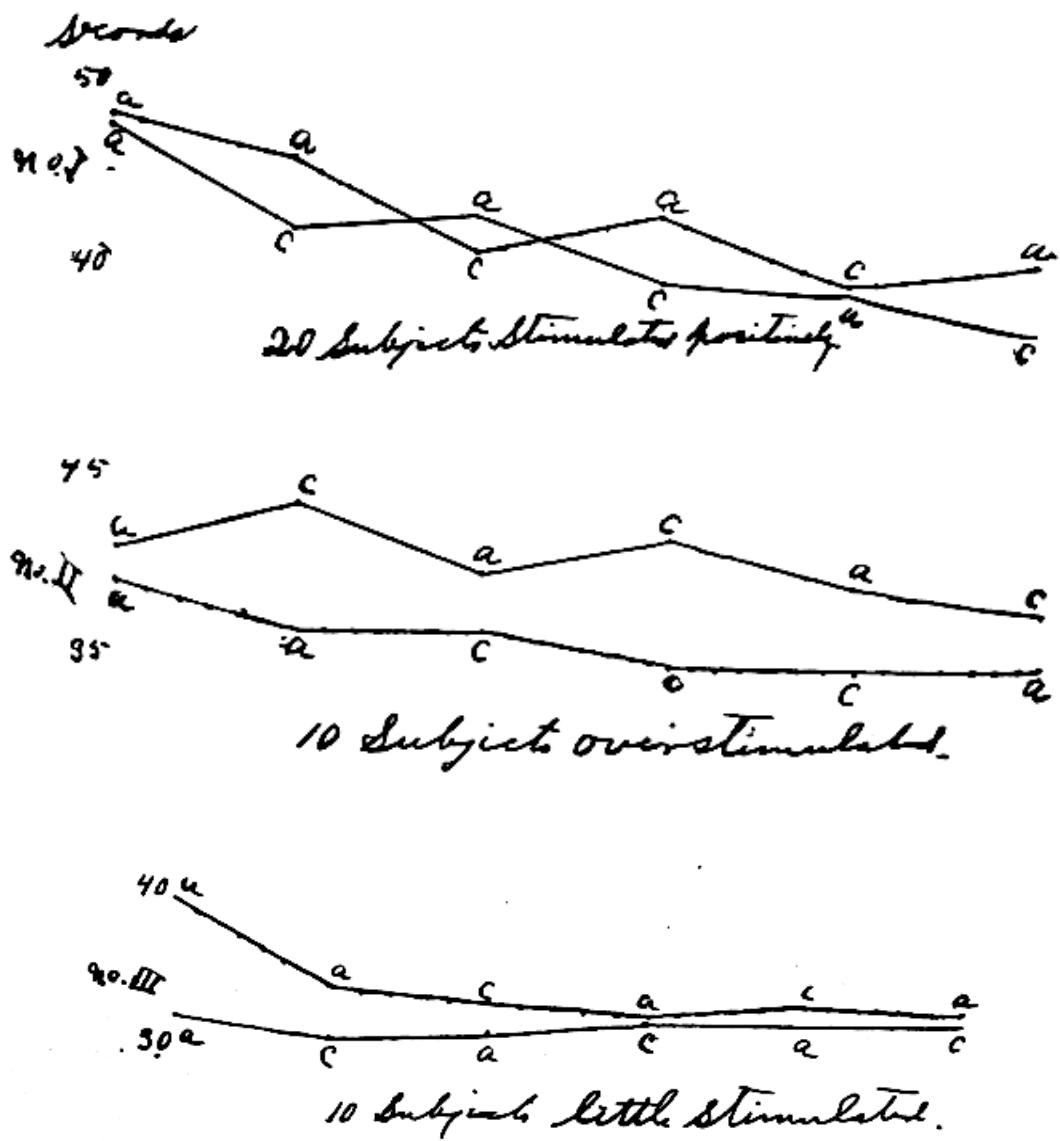


Chart II Solid line represents Group A
Dotted B.

(Source: Triplett 1898 p524; (<http://psychclassics.yorku.ca/Triplett/>)

Figure 2 - hand-drawn chart of results from co-action experiment by Triplett (1898).

APPENDIX 4

	Stimulated	Stimulated	Little affected
Female	12	5	6
Male	8	5	4
Average age	11.4	11.1	12.4

(Data from Triplett 1898 Tables I-III pp521-2)

Table 11 - Breakdown of gender in Triplett's three groups of results.

PARTICIPANT	ALONE	COMPETITION
Violet F	47.2	43.2
Anna P	57.1	50.7
Willie H	39.3	37.1
Bessie V	39.6	34.5
Howard C	39.6	37.1
Mary M	47.9	43.1
Lois P	45.9	40.5
Inez K	35.6	33.9
Harvey L	41.5	38.4
Lora F	34.5	33.0
Stephen M*	46.1	41.4
Mary W*	50.4	45.4
Bertha A*	49.1	44.7
Clara L*	46.7	45.0
Helen M*	44.2	37.9
Gracie W*	46.8	41.1
Dona R*	36.4	36.5**
Pearl C*	40.4	40.3
Clyde G*	34.8	31.7
Lucile W*	46.3	40.6

(* = AACACA; others = ACACAC)

(** = performance worse in competition compared to alone; all others shown improvements)

(Data from Triplett 1898 Table I p521)

Table 12 - Mean times to turn fishing reels for 16 metres in what Triplett called "subjects stimulated positively" group.

PARTICIPANT	ALONE	COMPETITION
Jack R	43.4	44.3**
Helen F	43.6	45.4**
Emma P	37.3	37.9**
Warner J	41.7	41.5
Genevieve M	33.3	34.5**
Hazel M*	38.3	36.6
George B*	35.8	36.8**
Mary B*	43.7	45.7**
Carlisle B*	34.3	35.7**
Eddie H*	29.1	27.2

(* = AACACA; others = ACACAC)

(** = performance worse in competition compared to alone; all others showed improvement in competition)

(Data from Triplett 1898 Table II p522)

Table 13 - Mean times to turn fishing reels for 16 metres in what Triplett called "subjects stimulated adversely" group.

PARTICIPANT	ALONE	COMPETITION
Albert P	27.7	28.5**
Milfred V	35.3	30.5
Harry V	33.2	32.1
Robert H	32.9	33.1**
John T	31.9	31.4
Lela T*	39.1	37.0
Lura L*	39.0	37.5
Mollie A*	31.9	29.1
Anna F*	31.8	32.2**

(* = AACACA; others = ACACAC)

(** = performance worse in competition compared to alone; all others showed improvement)

(Data from Triplett 1898 Table III p522)

Table 14 - Mean times to turn fishing reels for 16 metres in what Triplett called "subjects little affected by competition" group.

APPENDIX 5

Apparatus. The basic apparatus consisted of a 20 X 20 X 20-inch clear plexiglass cube outfitted so as to house either a maze or a runway. A ISO-watt floodlight served as a source of noxious stimulation. In the centre of each vertical wall of the plexiglass housing, 8i inches from the top, was a rectangular if X J-inch opening, which could be closed by means of a guillotine gate made out of sheet metal. A set of tracks on the exterior of each opening served as a shoe for a goal box or a starting box, damping it firmly in place against the wall opening. Both the goal box and the starting box were made of 4-inch clear plexiglass tubing. A square flange that could slide into the shoe on the vertical wall of the housing was affixed to the opening of the boxes, while the other end of the tubing was sealed with J-inch clear plexiglass.

The maze and the runway could be suspended in the housing flush with the goal boxes and the starting boxes. Both the runway and the maze were made of black bakelite floor 2 inches wide, with walls made of clear plexiglass, 1 inch high. The runway and the maze were provided with clear plexiglass tops 4-inch thick. The runway consisted of a straight track running between two opposite vertical walls, and was 20 inches long. The maze was made of two runways, placed in the same plane and perpendicular to each other, thus forming a cross with the walls of the intersection removed. The lengths of the paths in the runway and in the maze, namely those leading from the starting box to the goal box or to a cul-de-sac, were 20 inches. The guillotine gates that separated the starting and goal boxes from the runway or maze were made of galvanized sheet metal. To attract the roach to the goal box an opaque cover, painted flat black on the inside, was placed over the box making its interior dark. A flat black posterboard, covering the entire 20 X 20-inch area, was hung on the wall which held the goal box.

For the groups in which the social variable was manipulated by means of a passive audience four 9 X 9 X 1-inch boxes with plexiglass sides and tops and bakelite floors were used. These boxes were placed inside the plexiglass cube housing in such a manner that their floors were flush with the floors of the runway or the maze and their sides directly contiguous with the walls of the runway or the maze. When these boxes were in position almost the entire extent of walls of the runway or maze were in direct contact with the sides of the audience boxes. Air holes in the sides of the boxes lined up with air holes in the walls of the runway and the maze to allow transmission of olfactory cues (Zajonc et al 1969 pp86-7).

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THE EVALUATION OF THE FUNDAMENTAL ATTRIBUTION ERROR

When explaining other people's behaviour, internal or external attribution of a cause are made. Internal or dispositional attributions relate to the individual (eg: personality characteristics) and external or situational attributions are the environment (Heider 1958). It is assumed by researchers that attribution is a process similar to that of perception.

However, there is an overemphasis on internal attributions compared to external. This is an attributional bias known as the "fundamental attribution error" (FAE) (Ross 1977).

More recently, Ross and Nisbett (1991) preferred to talk of "dispositionism":

.. people (1) infer dispositions from behaviour that is manifestly situationally produced, (2) overlook situation context factors of substantial importance, and (3) make overly confident predictions when given a small amount of information (p126).

1. Simple internal-external dichotomy

Attributions are more complex than either internal or external factors as causing the behaviour. In fact, both types of attribution exist depending on how the behaviour is viewed. For example, the statement "Jill bought the house because she wanted privacy" seems an obvious internal attribution. It is the behaviour of Jill that is the origin of the behaviour. But the seclusion offered by the house could be the cause of the behaviour, and this produces a situational explanation (Ross 1977). Behaviour should be understood as a combination of person and situation (Sabini et al 2001).

Gilbert and Malone (1995) felt that too much emphasis was put on the metaphor of "the human skin as a special boundary that separates one set of 'causal factors' from another. On the sunny side of the epidermis are the external or situational forces that press inward on the person, and on the meaty side are the internal or personal forces that exert pressure outward" (p21).

2. How attribution is studied

Traditionally, attribution is studied in laboratory experiments where individual's attributions are measured on Likert-type scales. This reduces the subtlety of attribution to numerical scores, and takes it out of real-life situations: "meaning may depend upon subtle

features of research context and instruction, features often beyond the experimenter's knowledge or control" (Ross 1977).

Also the FAE appears when measured by pencil and paper means, but not face-to-face (Winter and Uleman 1984).

Steiner (1974) has argued that attribution research is too individualistic.

3. The FAE is learned

The FAE only appears in later childhood, whereas young children focus on the situation (Kassin and Pryor 1985).

4. The FAE is not universal

The FAE is evident in Western societies, but not the same in non-Western cultures (Norenzayan and Nisbett 2000). In this case, "It is, then, hardly fundamental" (Smith and Bond 1993 p107).

5. The FAE is influenced by mood

The mood of the individual can influence the presence of the FAE with happy moods increasing its strength and sad moods reducing it (Forgas 1998).

6. Theoretical challenges

The phenomenological approach challenges the basis of the FAE which is objective thought, and the clear division of inside/outside, internal/external. It moves away from the search for causal laws in the experiment to focus upon subjective, lived experience. In terms of the lived experience, in everyday life "people apparently find the attribution of dispositions and traits useful" (Langridge and Butt 2004).

It does not matter whether a person is right or wrong in their perception; the focus is always on their perception of the world 'in its appearing': nothing more, nothing less. All reference to reality is set aside.. because phenomenological social psychologists believe that all we have to work with is people's experience (Langridge 2007 pp99-100).

Lalljee (1996) had a problem with the use of "error" or "bias" because "They smack of the implication that

there is a 'correct' answer, and an 'unbiased' way of processing information or making attributions; and the layperson is inadequate in this regard" (p108). He preferred to see the FAE as a "powerful tendency".

7. What is the FAE?

Ross and Nisbett (1991) explained the FAE as a tendency to attribute behaviour to dispositional factors rather than situational factors, while Sabini et al (2001) saw it as due to underestimating the importance of certain factors.

One of those factors, for Americans, is the motive to save face and to avoid embarrassment. This action is traditionally seen as important in non-Western cultures, like Japan, and ignored in the West.

Sabini et al (2001) defined embarrassment as "an aversive emotional state rooted in social interaction, involving flustering and the desire to hide, flee from, or dissolve the immediate social situation" (p2). It is often produced by the loss of face or "face threatening acts" (Brown and Levinson 1978) which show that "someone (self or other) is less worthy than their role requires them to be" (Sabini et al 2001 p2). The avoidance of embarrassment makes individuals to manipulate, and this is often overlooked by observers.

8. There are other attributional biases, particularly in relation to own behaviour

The FAE is only one of a number of attributional biases that can occur. With the actor-observer effect, for example, the actor makes different attributions depending on whether it is their or another's behaviour. "There is a pervasive tendency for actors to attribute their actions to situational requirements, whereas observers tend to attribute the same actions to stable personality dispositions" (Jones and Nisbett 1972).

In other words, you tripped over because you are clumsy, but I tripped over because of the uneven floor.

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PSYCHOBIZARRENESS THEORY (PBT) OF NEUROSES

Rofé (2002) felt that the traditional theoretical approaches of psychoanalysis, cognitive behavioural and biological theories could not adequately explain neurotic (anxiety) disorders. For example, the development of phobias without conditioning (Behaviourism).

Rofé (2000) proposed the PBT of neuroses which argued that individuals "rationally select" neurotic symptoms (or bizarre behaviours) when stress becomes too much. The neurotic symptoms draw attention away from the stress and help the individual to gain "control" over the situation. However, individuals are not aware that they are doing this because of "sophisticated self-deceptive mechanisms".

Rofé (2002) made the distinction between bizarre and non-bizarre behaviour. Bizarre neurotic behaviours includes agoraphobia, panic disorders, anorexia, and obsessions, while non-bizarre behaviour includes simple phobias, depression, and post-traumatic stress disorder.

Put another way, neurotic behaviours are "viewed as pathological coping mechanisms, which are consciously and rationally chosen to enhance the individual's coping abilities" (Rofé 2002) because such behaviours have high attentional demands (ie: distract the individual from stress-related thoughts). The awareness of this process is reduced by repression, defined as "a coping mechanism by which threatening materials are consciously prevented access to attention by actively implementing distracting manoeuvres" (Rofé 2002). In the PBT repression is divided into normal (distorting reality using socially accepted means) and pathological (the use of bizarre behaviours).

The process of unawareness involves encoding-inhibiting factors and memory-inhibiting mechanisms. The first are factors that limit the transfer of "knowledge of self-involvement" (KSI) from short to long-term memory, like "directed forgetting" or "self-deceptive distraction". Memory-inhibiting mechanisms cause the forgetting of KSI, and include state-dependent memory and suppression. The unawareness is perpetuated, in some cases, by "self-deceptive denial". This is the denial that the behaviours are maladaptive, like the anorexic who argues that they are "just thin".

Adopting such coping mechanisms of bizarre behaviour also gives the individual the benefits of the sick role, particularly in relation to others: "Not only are they required to take over many of the patients' functions - domestic, personal, financial and social - they have to devote increasing time and effort to the protection and comforting of the affected person" (Rachman and Hodgson 1980 p62).

The stress which triggers the bizarre behaviour can include unacceptable desires. For example, the case of a woman who had strong negative feelings towards her children. She developed obsessive thoughts and bizarre rituals to keep them safe. Thus "instead of injuring the child, she spent a good deal of her time every day performing irrational responses aimed at protecting them" (Neale et al 1982 p12).

The "choice" of neurotic symptoms by the individual depends upon a number of criteria:

- The need for controllability (or perceived controllability to be exact);
- The availability of symptoms from routine behaviour (eg: dieting becomes anorexia), family history, peer imitation, and the mass media (eg; articles on eating disorders in women's magazines);
- Cost-benefit analysis of coping benefits of bizarre behaviour against the cost of that behaviour (eg: social stigma).

In terms of therapy to resolve the bizarre behaviours, PBT takes an eclectic approach - both "technical eclecticism" (using "techniques from any discipline without necessarily endorsing any of the theories that spawned them"; Lazarus 1995 p31), and "theoretical eclecticism".

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